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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/586,183	06/01/2000	Paul Roller Michaelis	4366-16	5817

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EXAMINER	
STORM, DONALD L	

ART UNIT	PAPER NUMBER
2654	9

DATE MAILED: 05/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/586,183	MICHAELIS, PAUL ROLLER	
	Examiner	Art Unit	
	Donald L. Storm	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2004 and 22 March 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-12,14,15,17-28 and 30* is/are rejected.

7)☒ Claim(s) *9,16 and 29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s) *6*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *TBD*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other:

Applicant Initiated Interview Request Form.

DETAILED ACTION

Allowable Subject Matter

1. The indication of allowable subject matter in claims 5, 6, 8, 14, 15, 27, and 28 is withdrawn in view of the newly discovered reference Omori. Rejections based on the newly cited reference follow. The Examiner apologizes for prematurely indicating allowable matter and the belated discovery of grounds for rejection.

Information Disclosure Statement

2. A copy of the Canadian Office Action (paper 6) and the copies of the documents are present in the application file, and they have been considered by the Examiner.

Claim Informalities

3. Claims 9, 16, and 29 are objected to as being (directly or indirectly) dependent upon a rejected base claim. See MPEP § 608.01(n)V. The claim(s) would be allowable over the prior art of record if rewritten to include all of the limitations of the base claim and any intervening claims. Certain assumptions that make the limitations clear have been considered for claims 11 and 16, as described next or elsewhere in this Office action.

4. Claim 11, and by dependency claims 12-18, are objected to under 37 CFR 1.75(a) because the meaning of the phrase "said frame" needs clarification. Because no (singular) frame was previously said, it may be unclear as to what element this phrase refers. To further timely prosecution and evaluate prior art, the Examiner has interpreted this phase to refer to --the analyzed frame--. Alternatively, using the phrase --analyzing each frame of said frames-- would

provide clear antecedence. Either of these solutions also provides antecedence for the analyzed "frame" said in claim 16.

5. Claim 16 is objected to under 37 CFR 1.75(a) because the meaning of the phrase "said first frame" needs clarification. Because no first frame was previously said, it may be unclear as to what element this phrase refers. To further timely prosecution and evaluate prior art, the Examiner has interpreted this phase to refer to --the analyzed frame--.

Claim Rejections - 35 USC § 102

Doddington

6. Claims 1, 7, 10-12, 18-20, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Doddington [US Patent 4,696,039].

7. Regarding claim 1, Doddington [at abstract] describes processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

receiving a speech signal to be processed [at column 4, lines 47-48, as translating audible speech into input meaningful input for the system];

dividing it into frames [at column 6, lines 34-37, as convert input to frames and operate on data vectors of the frames];

analyze a frame to determine a spoken sound type associated with it [at column 8, line 54-column 9, line 3, as detect speech frame that has energy greater than the threshold and is voiced, and also reexamine immediately preceding, unvoiced frames which have energy greater than T to also designate them as "speech" frames];

modifying a sound parameter of the frame (or of another frame) [at column 7, line 13, as normalize the energy of each frame];

modifying it based on the spoken sound type [at column 9, lines 15-17, as normalize energy dependent on the voicing decision (also refer to column 7, lines 34-42, which discusses unvoiced /s/ normalized with respect to vowel /i/)].

8. Claims 7 and 10 are rejected using the same rationale as in the prior Office action (paper 5).

9. Regarding claim 11, Doddington [at abstract] describes processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

providing a speech signal that is divided into time-based frames [at column 6, lines 44-47, as providing frames of the speech analysis];

analyzing each frame in the context of surrounding frames [at column 8, line 48-column 9, line 13, as identifying following silent frames later as not silent, reexamining preceding frames to identify as nonsilent, and considering frames after the last frame to be silent];

analyzing in context determines a spoken sound type associated with *{the analyzed}* frame [at column 8, line 48-column 9, line 3, as assume frames following a silent frame are silent until detecting a speech frame that has energy greater than the threshold and is voiced, and also reexamine immediately preceding, unvoiced frames which have energy greater than T to also designate them as "speech" frames];

adjusting an amplitude of selected frames [at column 7, line 20, as normalize the energy of each frame];

adjusting an amplitude of selected frames based on a result of the analyzing [at column 7, lines 20-57, as the energy of the frame currently being taken will be normalized with respect to following high-energy periods and preceding voiced frames].

10. Claims 12 and 18 are rejected using the same rationale as in the prior Office action (paper 5).

11. Regarding claim 19, Doddington [at abstract] describes a system for processing a speech signal and the claimed limitations recognizable to one versed in the art as the following elements:

means for receiving a speech signal [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at columns 6-9 of processing frames of the speech analysis];

the speech signal is divided into time-based frames [at column 6, lines 44-47, as frames of the speech analysis];

means for determining a spoken sound type associated with each frame [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 8, line 54-column 9, line 3, of detecting a speech frame that has energy greater than the threshold and is voiced, and also reexamining immediately preceding, unvoiced frames which have energy greater than T to also designate them as "speech" frames];

means for modifying a parameter of selected frames [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 7, line 13, for normalizing the energy of each frame];

the parameter that is modified is a sound parameter [at column 5 [at column 6, lines 35-37, as the energy value that is operated on is data of the speech frames];

modifying it based on spoken sound type [at column 9, lines 15-17, as normalize energy dependent on the voicing decision (also refer to column 7, lines 34-42, which discusses unvoiced /s/ normalized with respect to vowel /i/)];

modifying is to enhance signal intelligibility [at column 10, line 66-column 11, line 7, as normalize energy will achieve higher throughput of intelligible speech information].

12. Claim 20 is rejected using the same rationale as in the prior Office action (paper 5).

13. Regarding claim 26, Doddington also describes:

means for ascertaining whether a frame includes a voiced or unvoiced sound [see Fig. 5, items 16, 18, 20, 24, 22, and their descriptions especially at column 8, line 54-column 9, line 3, for making a decision whether a frame is nonsilent (unvoiced speech, voiced speech) or silent (unvoiced, not speech)].

Omori

14. Claims 1, 5-6, 8, 19-20, 22, and 27-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Omori et al. [Japanese Patent Application Publication 10-124089].

15. Regarding claim 1, Omori [at title] describes a method for processing a speech signal by describing the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

receiving a speech signal to be processed [at detailed description 0018, as the sound signal applied to input is applied to circuit and filter];

dividing it into frames [at detailed description 0020, as frame the sound signal];

analyze a frame to determine a spoken sound type associated with it [at detailed description 0020-0021, as autocorrelate by the frame's LPC analysis and detect the affricate and a fricative];

modifying a sound parameter of the frame (or of another frame) based on the spoken sound type [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis controlled by the output of the affricate detector].

16. Regarding claim 5, Omori also describes:

changing an amplitude of the frame when the frame is determined to include a first spoken sound [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis when the affricate is detected].

17. Regarding claim 6, Omori also describes:

boosting the amplitude of the frame when the frame is determined to include an unvoiced plosive [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis when the affricate is detected (at 0011, short power and at 0043, explosive)].

18. Regarding claim 8, Omori also describes:

modifying the frame and another frame [at detailed description 45, as boost every frame].

19. Regarding claim 19, Omori [at title] describes a method for processing a speech signal by describing the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

means for receiving a speech signal [at detailed description 0018, as input to apply the sound signal];

the signal is divided into time-based frames [at detailed description 0020, as the sound signal is framed];

means for modifying a parameter of selected frames based on spoken sound type [at detailed description 0020-0021, as boost circuit boosts the excitation of the signal from the LPC remainder from the frame's LPC analysis controlled by the output of the affricate detector].

the parameter that is modified is a sound parameter [at detailed description 0011, as the excitation of the LPC remainder is of the sound signal];

modifying is to enhance signal intelligibility [at detailed description 0013, as the processor enables reproducing clearly].

20. Regarding claim 20, Omori also describes:

implementation in a LPC encoder [at detailed description 0018-0021, as escape system having LPC composition filter].

21. Regarding claim 22, Omori also describes:

implementation in a decoder [at detailed description 0008-0009, as receiver for reading narrowband and broadband code books and compounding a sound signal in the synthetic circuit];

the decoder is for LPC [at detailed description 0018-0021, as escape system having LPC composition filter].

22. Regarding claim 27, Omori also describes:

means for boosting the amplitude of a frame that includes a spoken sound type [at detailed description 0020-0021, as boost circuit boosts the excitation of the signal from the LPC remainder from the frame's LPC analysis with detected affricate and fricative];

that spoken sound is typically less intelligible than other sound types [at detailed description 0011, as the fricative and the affricate run short and become unclear].

23. Regarding claim 28, Omori also describes:

means for boosting the amplitude of a frame that includes an unvoiced plosive [at detailed description 0020-0021, as boost circuit boosts the excitation of the signal from the LPC remainder from the frame's LPC analysis when the affricate is detected (at 0011, short power and at 0043, explosive)].

Claim Rejections - 35 USC § 103

Doddington and Bordeaux

24. Claims 2-4, 17, 24-25, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doddington [US Patent 4,696,039] in view of Bordeaux [US Patent 4,852,170].

25. Claim 2 is rejected using the same rationale as in the prior Office action (paper 5).

26. Regarding claim 3, Doddington also describes:

analyzing includes determining whether the frame includes a voiced or unvoiced spoken sound [at column 8, line 48-column 9, line 3, as assume frames following a silent frame are silent until detecting a speech frame that has energy greater than the threshold and is voiced, and also reexamine immediately preceding, unvoiced frames which have energy greater than T to also designate them as "speech" frames].

Bordeaux also describes:

examining the spectral content to determine whether the frame includes a voiced or unvoiced spoken sound [see column 9, lines 9-60, as frequencies and formants used for testing voiced and unvoiced stops of the speech being analyzed].

27. Claim 4 is rejected using the same rationale as in the prior Office action (paper 5).

28. Claim 17 is rejected using the same rationale as in the prior Office action (paper 5).

29. Claims 24, 25, and 30 are rejected using the same rationale as in the prior Office action (paper 5).

Doddington and Furui

30. Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doddington [US Patent 4,696,039] in view of Sadaoki Furui, "Digital Speech Processing, Synthesis, and Recognition," Marcel Dekker, Inc., New York, 1989, pp. 70-81, 168-204 and 320-322.

31. Claim 21 is rejected using the same rationale as in the prior Office action (paper 5).

32. Regarding claim 22, Doddington [at column 1] describes that encoding received speech will be accompanied by decoding the encoding parameters for synthesis that corresponds to the speech analysis for playback through a loudspeaker. However, Doddington does not explicitly describe an LPC decoder for the encoded LPC parameters.

Furui [at section 4.6.3] points out that a major example of widely used speech analysis system is the LPC vocoder. For LPC vocoding, Furui describes:

an LPC decoder [at page 169, at the decoder of LPC vocoder].

Furui sets forth LPC decoding from LPC vocoding as conventional. It would have been obvious to one of ordinary skill in the art of vocoding at the time of invention to implement Doddington's modifications of speech parameters to enhance signal intelligibility in the decoder because any intelligible throughput that is lost on the transmission channel may be recoverable at the location where the parameters will be used to synthesize intelligible speech.

33. Regarding claim 23, Doddington [at columns 5-6] describes that there are various ways of encoding the LPC parameters. However, Doddington does not explicitly describe CELP encoding parameters and the decoder for them.

Furui [at page 320] points out that artisans in the speech-processing field are expected to compare the trade-offs incurred in using the various speech coding algorithms.

Among the well-known speech coding algorithms, Furui describes:

CELP [at page 321, at CELP coding algorithms]; and

a CELP decoder [at page 194, as decoder storing the same vector].

Furui sets forth CELP encoding as conventional and that choosing among coding algorithms and using them is within the ordinary skill of artisans to satisfy desired operating characteristics. It would have been obvious to one of ordinary skill in the art of speech encoding to trade off the cost, complexity, capability, and availability of known hardware and select the desired operating characteristics to achieve the desired advantages. CELP would be one of the obvious choices for Doddington's other speech coding techniques because CELP coding provides low bit rate for naturalness in recording, storage, and retrieval for synthesized speech, and by implementing Doddington's modifications of speech parameters to enhance signal intelligibility in the decoder, any intelligible throughput that is lost on the transmission channel may be recoverable at the location where the parameters will be used to synthesize intelligible speech.

Omori and Doddington

34. Claims 11 and 14-15 are rejected under 35 U.S.C. 102(b) as being unpatentable over Omori et al. [Japanese Patent Application Publication 10-124089] in view of Doddington [US Patent 4,696,039].

35. Regarding claim 11, Omori [at title] describes a method for processing a speech signal by describing the content and functionality of the recited limitations recognizable as a whole to one versed in the art as the following terminology:

providing a speech signal [at detailed description 0018, as applying the sound signal to input, to circuit, and to filter];

the signal is divided into time-based frames [at detailed description 0020, as frame the sound signal];

analyzing each frame to determine a spoken sound type associated with it [at detailed description 0020-0021, as autocorrelate by the frame's LPC analysis and detect the affricate and a fricative];

adjusting an amplitude of selected frames based on a result of the analyzing [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis controlled by the output of the affricate detector].

Omori [at detailed description 0039-0044, describes only classification criteria that examine a frame without the context of surrounding frames.

Doddington [at columns 6-9] also describes adjusting frame amplitudes based on voiced or unvoiced speech. A criterion that Doddington uses to determine a frame's sound type includes the following:

analyzing each frame in the context of surrounding frames [at column 8, line 48-column 9, line 13, as identifying following silent frames later as not silent, reexamining preceding frames to identify as nonsilent, and considering frames after the last frame to be silent];

analyzing in context determines a spoken sound type associated with *{the analyzed}* frame [at column 8, line 48-column 9, line 3, as assume frames following a silent frame are silent until detecting a speech frame that has energy greater than the threshold and is voiced, and also reexamine immediately preceding, unvoiced frames which have energy greater than T to also designate them as "speech" frames].

Both Doddington and Omori seek to improve the intelligibility of coded, decoded, and reconstructed speech. Doddington provides other criteria that determine a type of speech that characterizes a frame's sound. It would have been obvious to one of ordinary skill in the art of speech reconstruction at the time of invention to add Doddington's concept of determining sound

type of a frame's signal in the context of surrounding frames because that would add certainty to Omori's determination and add additional classifications to synthesize still clearer speech.

36. Regarding claim 14, Omori also describes:

increasing the amplitude of a frame when the spoken sound type of the frame includes an unvoiced plosive [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis when the affricate is detected (at 0011, short power and at 0043, explosive)].

37. Regarding claim 15, Omori also describes:

increasing the amplitude of a frame when the spoken sound type of the frame includes an fricative [at detailed description 0020-0021, as boost the excitation of the signal from the LPC remainder from the frame's LPC analysis when the fricative is detected].

Response to Arguments

38. The prior Office action, mailed November 20, 2003 (paper 5), objects to the claims, and rejects claims under *35 USC § 102* and *§ 103*, citing Doddington and others. The Applicant's arguments and changes in AMENDMENT AND RESPONSE filed March 22, 2004 (paper 7) have been fully considered with the following results.

39. With respect to objection to the claims, the/some claims are dependent upon rejected base claims. Those objections that remain are repeated elsewhere in the Office action. The objections to claims not objected above are removed.

40. With respect to objection to the claims dependent upon rejected base claims, the base claims have been allowed. Accordingly, the objections are removed.

41. With respect to the indication of substantially duplicate claims, the Examiner concurs with the Applicant's position. The Examiner apologizes for misreading the claims.

42. With respect to rejection of claims under *35 USC § 102* and *§ 103*, citing Doddington alone and in combination, the Applicant's arguments appear to be as follows:

The Applicant's argument appears to be that the independent claims differ from descriptions in Doddington because Doddington only distinguishes voiced sound frames (spoken) and silent frames (not spoken). This argument is not persuasive because Doddington also distinguishes voiced, spoken frames; unvoiced, spoken frames; and silent, not-spoken frames at column 8, line 54-column 9, line 3. Please see the rejections that cite Doddington for further details.

The Applicant's arguments have been fully considered but they are not persuasive. Accordingly, the rejections are maintained.

Conclusion

43. Any response to this action should be mailed to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306, (for formal communications intended for entry)

Or:

(703) 872-9306, (for informal or draft communications, and please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA (Sixth Floor, Receptionist)

44. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donald L. Storm, of Art Unit 2654, whose telephone number is (703) 305-3941. The examiner can normally be reached on weekdays between 8:00 AM and 4:30 PM Eastern Time. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by e-mail at: ebc@uspto.gov.

RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER

Donald L. Storm
Donald L. Storm
May 13, 2004